MICROSYTEMS ENGINEERING
STD BUS SOFTWARE PRODUCT DESCRIPTION

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REVISION HISTORY

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INTERSIL MICROCOMPUTER SOFTWARE PACKAGE

INTERSIL OFFERS POWERFUL SOFTWARE PACKAGES IN SUPPORT OF IT'S STD BUS PRODUCT LINE FOR THE 8080/8085 AND Z80 MICROPROCESSORS.

THESE PACKAGES INCLUDE A POWERFUL OPERATING SYSTEM; A LARGE SELECTION OF EXTENDED PROGRAMMING LANGUAGES; A REAL TIME MULTITASKING CONTROL MONITOR; A FIRMWARE PACKAGE WITH MONITOR, EDITOR, AND ASSEMBLER.

ALL SOFTWARE IS AVAILABLE ON 8 OR 5 1/4 FLOPPY DISKS AND IS SUPPORTED BY A DIAGNOSTIC PACKAGE FOR EACH CARD.

OPERATING SYSTEM - ICP/M

INTERSIL OFFERS THE CP/M (R) OPERATING SYSTEM FROM DIGITAL RESEARCH WHICH INCLUDES AN OPERATING SYSTEM AND UTILITIES. CP/M SUPPORTS A NAMED FILE SYSTEM USING A MAXIMUM OF 16 LOGICAL DRIVES.

MAJOR PROGRAMS WITHIN CP/M INCLUDE A TEXT EDITOR, ASSEMBLER, DEBUG PROGRAM AND A BATCH OPERATION MODE.

ED- TEXT EDITOR (ED)

ED ALLOWS THE CREATION AND SUBSEQUENT MODIFICATION OF ASCII FILES. A MAJOR USE OF ED IS TO CREATE AND MODIFY PROGRAMMING FILES.

ASM- ASSEMBLER (ASM)

ASM IS AN ASSEMBLER THAT PRODUCES STANDARD 8080 NON-RELOCATABLE CODE. ASM GENERATES A STANDARD INTEL TYPE HEX FILE AND PRINT FILE.

DEBUG PROGRAM (DDT)

THE DDT COMMAND IS USED TO FIND AND CORRECT THE ERRORS IN A PROGRAM. THE PROGRAM CAN BE EXECUTED SINGLE STEP OR UNTIL REACHING A PREASSIGNED BREAKPOINT. AT EACH BREAKPOINT, THE CONTENTS OF REGISTERS AND MEMORY LOCATIONS CAN BE DISPLAYED AND ALTERED. ALSO, THE HEXADECIMAL CODES CAN BE DISASSEMBLED TO BE LISTED IN MNEMONICS.

BATCH OPERATION MODE (SUBMIT)

SUBMIT ALLOWS THE USER TO EXECUTE A SEQUENCE OF CP/M COMMANDS. IF A SEQUENCE OF CP/M COMMANDS IS FREQUENTLY USED BY AN OPERATOR, IT WOULD BE CONVENIENT TO GIVE A NAME TO THE SEQUENCE, AND EXECUTE IT WITH A SINGLE COMMAND, JUST LIKE A PROGRAM.

FORMAT

FORMAT ALLOWS THE USER TO PUT AN UNKNOWN DISKETTE IN CP/M COMPATIBLE FORMAT. THIS OPERATION IS REQUIRED FOR EACH NEW DISKETTE OR REUSABLE OLD DISKETTE. THE INFORMATION ON THE DISKETTE WILL BE ERASED ENTIRELY. A FAIL MESSAGE WILL BE DISPLAYED IF THE DISKETTE CANNOT BE FORMATTED.

CP/M FURTHER HAS UTILITIES THAT AID IN FILE MANAGEMENT AND ORGANIZATION OF FILES. THESE ARE: PIP, LOAD, REN, DIR, TYPE, SAVE, SYSGEN, MOVCPM, STAT, AND DUMP.

PIP- PERIPHEAL INTERCHANGE PROGRAM (PIP)

PIP ALLOWS THE INTERCHANGE BETWEEN DEVICES AND DISK FILES. PIP IS USED TO COPY AND LIST THE CONTENTS OF FILES.

LOAD-

LOAD CONVERTS INTEL HEX FORMATTED (ASSEMBLED) CODE TO ABSOLUTE BINARY CODE SO THAT THE CODE CAN BE RUN A A CP/M COMMAND.

REN- RENAME

REN ALLOWS USER TO CHANGE THE NAME OF FILE.

DIR- DIRECTORY

DIR IS USED TO DISPLAY A LIST OF ALL FILES PRESENT ON THE DISKETTE.

TYPE-

THE TYPE COMMAND IS USED TO DISPLAY ANY ASCII FILE ON THE CRT. BY PUSHI A CTRL-P, THE PRINTER WILL ECHO THE CRT. ANOTHER CTRL-P WILL TURN THE PRINTER OFF.

SAVE-

THE SAVE COMMAND IS USED TO STORE INFORMATION FROM THE MAIN MEMORY.

SYSGEN- SYSTEM GENERATION

SYSGEN ALLOWS USER TO COPY CP/M FROM ONE DISK TO ANOTHER. THE PROGRAM TURNS AN ORDINARY DISKETTE INTO A SYSTEM DISKETTE.

MOVCPM- MOVE CP/M

PROVIDES FOR RE-GENERATION OF CP/M FOR DIFFERENT MEMORY SIZE CONFIGURATI FOR EXAMPLE, AFTER CALLING MOVCPM AND SYSGEN, ONE CAN CREATE A 32K OR 64K SYSTEM.

STAT- STATUS

STAT IS USED TO DISPLAY STATUS OR CHANGE DEVICE ASSIGNNMENT. THE COMMAN IS A SIMPLE WAY TO DISPLAY AVAILABLE DISK SPACE AND DISK SPACES ALLOCATED BY EACH FILE. IT CAN ALSO BE USED TO DISPLAY AND MODIFY DEVICE ASSIGNMENTS.

DUMP-

THE DUMP COMMAND DUMPS A MEMORY AREA OF A PROGRAM ONTO THE TERMINAL DISPLAY.

(R)- CP/M IS A REGISTERED TRADEMARK OF DIGITAL REASEARCH INC.

MACRO ASSEMBLER - IMAC

MINIMUM MEMORY REQUIRMENT - 14K BYTES

MACRO-80 IS A RELOCATABLE MACRO ASSEMBLER FOR 8080 AND Z80. THE PACKAGE IS COMPRISED OF THE ASSEMBLER, A LINKING LOADER, AND CROSS REFERENCE FACILIT THE ASSEMBLER FEATURES COMMENT BLOCKS, VARIABLE INPUT RADIX, INCLUDING AN ALTERNATE SOURCE FILE INTO THE CURRENT PROGRAM. USERS CAN ALSO TAKE ADVANTA OF THE COMPLETE SET OF LISTING CONTROLS TO SIMPLIFY THE PROGRAMMING.

LINKING LOADER AND CROSS REFERENCE FACILITY

WITH LINK80, ANY NUMBER OF RELOCABLE MODULES CAN BE LOADED IN USER-SPECIFIED LOCATIONS, AND EXTERNAL REFERENCES BETWEEN MODULES ARE RESOLV AUTOMATICALLY BY THE LOADER.

CREF80, THE CROSS REFERENCE FACILITY SUPPLIES A CONVENIENT ALPHABETIC LI OF ALL PROGRAM VARIABLE NAMES, ALONG WITH THE LINE NUMBER WHERE THEY ARE REFERENCED AND DEFINED.

FORTRAN-80 - IFORT

MINIMUM MEMORY REQUIREMENT: 25K BYTES

FEATURES

FORTRAN-80 INCLUDES ALL OF ANSI FORTRAN X3.9-1966 EXCEPT THE COMPLEX DATA TYPE. USERS MAY TAKE ADVANTAGE OF APPLICATION PROGRAMS ALREADY WRITTEN IN FORTRAN. AN EXTENSIVE LIBRARY OF SINGLE AND DOUBLE PRECISION FUNCTIONS IS SUPPLIED.

LIBRARY

THE FOLLOWING LISTS THE ROUTINES IN THE LIBRARY:

ABS	AMAX0	DMAX1	AMAX1	AMIN0
INT	IDINT	DMIN1	ISIGN	DLOG10
MIN1	DATAN	AMIN1	FLOAT	ALOG10
SIGN	DSIGN	ATAN2	DSQRT	DATAN2
IDIM	DEXP	DCOS	ATAN	DMOD
OUT	IABS	SNGL	ALOG	TANH
SIN	PEEK	DABS	AMOD	MAX0
DBLE	DLOG	DSIN	SQRT	POKE
AINT	MOD	MAX1	MIN0	IFIX
DIM	EXP	COS	INP	

ENHANCEMENTS

1. LOGICAL VARIABLES CAN BE USED AS INTEGER QUANTITIES IN THE RANGE OF -128 TO +127.

2. LOGICAL DO LOOPS FOR TIGHTER, FASTER EXECUTION OF SMALL VALUED INTEGER LOOPS.

3. MIXED MODE ARITHMETIC.

4. HEXIDECIMAL CONSTANTS.

5. LITERALS AND HOLLERITHS ALLOWED IN EXPRESSIONS.

6. LOGICAL EXPRESSIONS ON INTEGER DATA.
   THE EXPRESSIONS AND,OR,XOR,NOT, CAN BE USED FOR 8 AND 16 BIT ARITHMETIC.

7. READ/WRITE WITH END OF FILE AND ERROR CONDITION.
   WHERE END=N AND ERR=M AND M AND N ARE STATEMENT NUMBERS.

8. ENCODE/DECODE FOR FORMAT OPERATIONS TO MEMORY.

9. IMPLICIT STATEMENT CHANGES DEFAULT VARIABLE TYPES.

COMPILER CHARACTERISITICS

1. COMMON SUBEXPRESSION ELIMINATION. COMMON SUBEXPRESSIONS ARE EVALUATED ONCE, AND THE VALUE IS SUBSTITUTED IN LATER OCCURRANCES OF THE SAME EXPRESSION.

2. PEEPHOLE OPTIMIZATION. SMALL SECTIONS OF CODE ARE REPLACED BY MORE COMPACT FASTER CODE IN SPECIAL CASES.

3. CONSTANT FOLDING. INTEGER CONSTANT EXPRESSIONS ARE EVALUATED AT COMPILE TIME.

4. BRANCH OPTIMIZATIONS. THE NUMBER OF CONDITIONAL JUMPS IN ARITHMETIC AND LOGICAL IF'S IS MINIMIZED.

5. ERROR MESSAGES ARE DESCRIPTIVE OF THE PROBLEM.

BASIC80 INTERPRETER - IBASI

FEATURES
MINIMUM MEMORY REQUIREMENT- 8K BYTES

BASIC-80 IS THE MOST EXTENSIVE IMPLEMENTATION OF BASIC AVAILABLE FOR 808 AND Z80 MICROPROCESSORS. IT MEETS THE REQUIREMENTS FOR ANSI SUBSET STANDARD FOR BASIC. EXTENSIVE PROGRAM EDITING AND A COMPLETE SET OF FILE MANIPULATIO ARE SUPPORTED. TRACE FACILITIES, DIRECT ACCESS TO CPU I/O PORT AND TO ANY MEMORY LOCATIONS ARE AVAILABLE. STRUCTURE-LIKE PROGRAM STATEMENTS AND CHARACTER STRING MANIPULATION FUNCTIONS ENHANCE THE CAPABILITY OF THIS INTERPRETER.

LIBRARY

ABS	INT	SGN	ATN
EXP	SIN	CDBL	CSNG
CINT	SQI	LOG	FIX
COS	RND	TAN	CLOSE
KILL	OUT	READ	RESTORE
TAB	DATA	PRINT	LINEINPUT
GET	POS	WRITE	FIELD
LSET	RSET	LOS	PRINTUSING
MKI$	MKS$	MKD$	NAME
PUT	EOF	SPC	INKEY$
CVI	CVD	OPEN	INPUT
CVS	ASC	LEN	STRING$
CHR$	STR$	HEX$	LEFT$
OCT$	VAL	INSTR	RIGHT$
MID$	ERL	USR	SPIKE$
ERR	FRE	PEEK	VARPTR

ENHANCEMENTS

1. LONG VARIABLE NAMES-VARIABLE NAMES MAY HAVE UP TO 40 CHARACTERS AND MAY CONTAIN EMBEDDED, RESERVED WORDS
2. PROTECTED FILES-DISK FILES MAY BE SAVED IN A CODED FORMAT.
3. DYNAMIC STRING SPACE ALLOCATION- NO NEED TO RESERVE EXTRA STRING SPACE.
4. WHILE/WEND STATEMENT-A NEW STATEMENT ALLOWING BASIC TO HAVE A STRUCTURED FLAVOR.
5. CHAIN AND COMMON STATEMENTS-PROGRAMS MAY BE LINKED TOGETHER AND SHARE COMMON VARIABLES.
6. RANDOMIZE STATEMENT-RESEEDS THE RANDOM NUMBER GENERATOR.
7. VARIABLE LENGTH RECORDS-RANDOM FILE RECORD LENGTH MAY BE DETERMINED BY THE USER.

BASIC COMPILER - IBASC
MINIMUM MEMORY REQUIRMENT- 40K BYTES WITH CP/M SYSTEM
FEATURES

THIS SINGLE-PASS COMPILER PRODUCES EXTREMELY EFFICIENT, OPTIMIZED 8080 MACHINE CODE IN MICROSOFT STANDARD RELOCATABLE BINARY FORMAT. EXECUTION SPEED IS TYPICALLY 3-10 TIMES FASTER THAN BASIC-80 INTERPRETER. THE BASIC COMPILER PRODUCES OBJECT CODE THAT IS HIGHLY OPTIMIZED FOR SPEED AND SPACE, RELOCATABLE, AND COMPATIBLE WITH, OTHER MICROSOFT SOFTWARE PRODUCTS.

LIBRARY

ABS	INT	SGN	ATN
EXP	STN	CDBL	CSNG
CINT	SQ1	LOG	FIX
COS	RND	TAN	CLOSE
KILL	OUT	READ	RESTORE
TAB	DATA	PRINT	LINEINPUT
GET	POS	WRITE	FIELD
LSET	RSET	LOS	PRINTUSING
MK1$	MKS$	MKD$	NAME
PUT	EOF	SPC	INKEY$
CVI	CVD	OPEN	INPUT
CVS	ASC	LEN	STRING$
CHR$	STR$	HEX$	LEFT$
OCT$	VAL	INSTR	RIGHT$
MID$	ERL	USR	SPIKE$
ERR	FRE	PEEK	VARPTR

ENHANCEMENTS

1. LONG VARIABLE NAMES-VARIABLE NAMES MAY HAVE UP TO 40 CHARACTERS AND MAY CONTAIN EMBEDDED RESERVED WORDS
2. PROTECTED FILES-DISK FILES MAY BE SAVED IN A CODED FORMAT.
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5. CHAIN AND COMMON STATEMENTS-PROGRAMS MAY BE LINKED TOGETHER AND SHARE COMMON VARIABLES.
6. RANDOMIZE STATEMENT-RESEEDS THE RANDOM NUMBER GENERATOR.
7. VARIABLE LENGTH RECORDS-RANDOM FILE RECORD LENGTH MAY BE DETERMINED BY THE USER.

COMPILER CHARACTERISTICS

1. EXPRESSIONS ARE REORDERED TO MINIMIZE TEMPORARY STORAGE AND TRANSFORM FLOATING POINT DIVISION INTO MULTIPLICATION
2. CONSTANT MULTIPLICATION ARE DISTRIBUTED TO ALLOW MORE COMPLETE CONSTANT FOLDING.
3. CONSTANTS ARE FOLDED WHENEVER POSSIBLE.
4. PEEPHOLE OPTIMIZATIONS ARE PERFORMED INCLUDING STRENGTH REDUCTION.
5. THE CODE GENERATOR IS TEMPLATE DRIVEN ALLOWING OPTIMAL SEQUENCES TO BE GENERATED FOR THE MOST COMMONLY USED OPERATIONS.
6. STRING OPERATIONS ARE EXTREMELY FAST.

COMPARISION OF BASIC-80 INTERPRETER WITH BASIC COMPILER

BASIC80

DIFFERENCES
1. INTERPRETER, DOES NOT GENERATE OBJECT CODE.
2. REQUIRES MINIMUM 8K MEMORY.

REASON TO USE BASIC
1. EASY TO PROGRAM.
2. GOOD ON STRING HANDLING AND MATH OPERATIONS.

ADVANTAGES
1. EASY TO DEBUG.
2. WIDELY ACCEPTED BY INDUSTRY.
3. MEMORY REQUIREMENT IS ONLY 8K.
4. BASIC CAN BE PUT IN ROM.

DISADVANTAGES
1. SLOW.
2. DOES NOT GENERATE OBJECT CODE.

BASIC

DIFFERENCES
1. ONE-PASS COMPILER PRODUCING 8080 OBJECT CODE.
2. REQUIRES MINIMUM OF 40K MEMORY.

REASON TO USE BASIC
1. EASY TO PROGRAM.
2. GOOD ON STRING HANDLING AND MATH OPERATIONS.

ADVANTAGES
1. 3-10 TIMES FASTER THAN BASIC80.
2. CAN MAKE EPROM FROM OBJECT
3. CAN LINK WITH ASSEMBLY.

DISADVANTAGES
1. MUST RE-COMPILE THEN RE-EXECUTE
2. LARGE MEMORY REQUIREMENT.
3. NOT FEASIBLE TO PUT COMPILER IN ROM

MINIMUM MEMORY REQUIREMENT- 52K BYTES WITH CP/M 2.2 SYSTEM.

THE PASCAL SYSTEM FEATURES A COMPILER, LINKER, DEBUGGER, AND DISASSEMBL
THE COMPILER ACCEPTS INTERNATIONAL STANDARDS ORGANIZATION STANDARD PASCAL AND GENERATES MICROSOFT FORMAT, RELOCATIBLE CODE FOR 8080/Z80 CPU. THE LINKER COMBINES PASCAL AND ASSEMBLY LANGUAGE MODULES INTO AN EXECUTABLE FIL
IN THE CP/M ENVIRONMENT. THE PASCAL FEATURES THE STANDARD PASCAL DATA TYPES, ALONG WITH STRING, BYTE, WORD, BCD REAL, AND FILE DATA TYPES.

EXTENSIONS

```
        SETBIT   TSTBIT   HI       LO
        SWAP     SHL      SHR      CONCAT
        COPY     DELETE   INSERT   LENGTH
        POS      ASSIGN   OPEN     CLOSE
        OPENX    PURGE    WNB      SEEKREAD
        WAIT     ADDR     EXIT     MEMAVAIL

        FILLCHAR          MOVELEFT           MOVERIGHT
        BLOCKREAD         BLOCKWRITE         CLRBIT
        SEEKREAD          SEEKWRITE          MAXAVAIL
        ABSOLUTE          IORESULT           CLOSEDEL
        INTERRUPT
```

KERNEL - IREX

MINIMUM MEMORY REQUIREMENT - 4K BYTES

USAGE: THE INTERSIL REALTIME MULTI-TASKING EXECUTIVE (IREX) IS AN EXECUTIVE TO BE LOADED WITH A USER PROGRAM. IT PROVIDES MULTI-TASKING, DYNAMIC STORAGE ALLOCATION, REAL TIME CLOCK, SUSPENSION/REACTIVATION/DELETION OF TASKS, AND TRANSMIT/ RECEIVE OF SINGLE BYTE, NON-ZERO MESSAGES.

SYSGEN: THE KERNEL IS STRUCTURED WITH A SYSTEM GENERATION PROGRAM WHICH ALLOWS THE USER TO INCLUDE ONLY THOSE MODULES WHICH ARE NECESSARY TO SUPPORT A PARTICULAR APPLICATION. ALL IO MODULES ARE SEPARATE AND MAY BE ADDED AS REQUIRED.

FUNCTIONS:

CREATE A TASK (KTCTASK): ALLOWS USER TO CREATE A PARALLEL TASK.

DELETE A TASK (KTIDEL): ALLOWS USER TO DELETE A PREVIOUSLY CREATED TASK.

SUSPEND A TASK (KTISUSP): ALLOWS A TASK TO BE SUSPENDED AND THUS LETS ANOTHER TASK BECOME ACTIVE.

REACTIVATE A TASK (KTIRDY): ALLOWS A TASK WHICH HAS BEEN PREVIOUSLY SUSPENDED TO BE REACTIVATED AND QUED UP FOR EXECUTION.

TASK TIMEOUT (KTIWAIT): ALLOWS A TASK TO BE SUSPENDED FROM EXECUTING FOR A GIVEN PERIOD OF TIME.

CHANGE TASK PRIORITY (KTIPRIOR): ALLOWS USER TO CHANGE A TASK'S PRIORITY AND THUS HAVE CONTROL OVER WHICH TASK IS IN CONTROL OF THE CPU.

TRANSMIT/RECEIVE (KTXMT/KTREC): ALLOWS INTERTASK COMMUNICATION OF SINGLE BYTE, NON-ZERO MESSAGES.

ALLOCATE MEMORY (KTMEMGET): ALLOWS USER TO ALLOCATE CONTIGUOUS MEMORY TO A TASK IN BLOCKS OF 128 BYTES.

RELEASE MEMORY (KTMEMREL): ALLOWS USER TO RETURN PREVIOUSLY ALLOCATED BLOCKS OF MEMORY TO THE AVAILABLE MEMORY POOL.

REALLOCATE STACK (KTRSTACK): ALLOWS USER TO OVERRIDE THE 16 WORD STACK NORMALLY GIVEN TO A TASK IF MORE STACK SPACE IS REQUIRED.

INPUT CONTROL HANDLER (KTINP): HANDLES AN INTERRUPT BY CALLING THE APPROPRIATE IO HANDLER.

OUTPUT CONTROL HANDLER (KTOUT): SAME AS INPUT CONTROL HANDLER FOR OUTPUT TO A DEVICE.

FIRMWARE MONITOR - IFMON

MINIMUM MEMORY REQUIREMENT - 2K BYTES

THE Z80/8080 ONLINE MONITOR MAKES IT POSSIBLE TO CONTROL STD SYSTEMS WHICH CONTAIN EITHER A Z80 OR AN 8085 CPU CARD RUNNING UNDER THE CP/M OPERATING SYSTEM. THE MONITOR CONTAINS COMMANDS TO FACILITATE THE DEBUGGING OF STD SYSTEMS. COMMANDS INCLUDE EXAMINING AND CHANGING CPU REGISTERS AND MEMORY, DISPLAY, MOVE, AND INITIALIZE BLOCKS OF DATA, SET BREAKPOINTS AND EXECUTE USER PROGRAMS.

TRANSFER OF CONTROL TO A PROGRAM IN MEMORY MAY BE COMMANDED FROM THE KEYBOARD, WITH UP TO FOUR BREAKPOINTS SET (IF THE PROGRAM IS IN RAM). UPON REACHING A BREAKPOINT, CONTROL IS RETURNED TO THE MONITOR, AND THE VALUE OF THE CPU REGISTERS AT THE TIME OF THE BREAK IS DISPLAYED. MEMORY AND/OR REGISTERS MAY BE ALTERED BEFORE CONTROL IS RETURNED TO THE USER PROGRAM.

THE FOLLOWING SUMMARIZES THE COMMANDS OF THE FIRMWARE MONITOR:

>	MONITOR COMMAND PROMPT.
(...)	OPTIONAL USER ENTRY.
DD	DATA INPUT, ONE BYTE (1-2 HEX DIGITS).
DDDD	DATA INPUT, ONE WORD (1-4 HEX DIGITS)
HH	DATA INPUT, 2 HEX DIGITS REQUIRED.
ADDR	ADDRESS INPUT (I-4 HEX DIGITS)
DD,DDDD	DATA BYTE, WORD DISPLAYED BY MONITOR.
BBBBBBBB	BINARY DATA DISPLAYED BY MONITOR
SPACE	ANY SPACE IN THE COMMAND DESCRIPTION IS FOR READABILITY ONLY.
	CARRIAGE RETURN.
CTRL	CONTROL KEY.

INTERSIL'S FIRMWARE DEBUG-DEVELOPMENT PACKAGE CONSISTS OF ROM BASED RESIDENT MONITOR, ASSEMBLER, AND TEXT EDITOR.

FEATURES:

ROM BASED MONITOR-IFROM (FIRMWARE RESIDENT OPERATING MONITOR)
ROM BASED EDITOR- IFEDIT
ROM BASED ASSEMBLER (Z80 OR 8085 MNEMONICS)-IFASM

MINUMUM HARDWARE REQUIREMENTS

12K ROM
52K RAM
COMMUNICATION CARD
TERMINAL
CPU CARD (Z80 OR 8085)

RESIDENT MONITOR - IFROM

THE RESIDENT MONITOR (IFROM) IS A ROM BASED MONITOR THAT ACTIVATES THE ASSEMBLER AND EDITOR AND AIDS IN DEBUGGING STD DELVELOPMENT. IFROM EXECUTES WITH Z80 AND 8085 CPU'S.

CAPABILITIES OF MINUMUM SYSTEM

WITH THE MINIMUM SYSTEM, AN ASSEMBLY SOURCE FILE CAN BE CREATED AND EDITED IN MEMORY. THE SOURCE MAY BE ASSEMBLED WITHOUT DESTROYING IT. THE ASSEMBLED CODE CAN BE DEBUGGED USING IFROM AS AN AID. IFROM HAS THE CAPABILITY OF MODIFYING THE CODE, SETTING BREAKPOINTS, AND EXECUTING THE CODE.

THE FOLLOWING COMMANDS ARE AVAILABLE IN THE FORM OF LETTER INPUTS:

COMMAND CHARACTER	FUNCTION
A	ACTIVATE ASSEMBLER
E	ACTIVATE EDITOR
G	BEGIN EXECUTION (GO)
I	INPUT DATA FROM I/O PORT
M	MOVE A BLOCK OF DATA IN MEMORY
O	OUTPUT DATA TO I/O PORT
P	SET BREAKPOINT (PAUSE)
S	SEARCH FOR A BYTE
T	TABLULAR DISPLAY OF MEMORY
X	INITIALIZE MEMORY
NNN/	DISPLAY MEMORY AT ADDRESS NNN

ASSEMBLER - IFASM

THE ASSEMBLER IS ENTERED VIA IFROM (USING AN A). THE ASSEMBLER HAS MOST OF THE FEATURES OF LARGER ASSEMBLERS, THUS ALLOWING FOR MAXIMUM FLEXIBILITY IN THE SYSTEM.

FEATURES OF ASSEMBLER
THE CODE IS IN ROM
THE .Z80 OR .8085 SWITCH SETS THE ASSEMBLER
TO Z80 OR 8085 MNEMONICS.
OBJECT CODE IS ASSEMBLED DIRECTLY INTO MEMORY
WITH THE LOC DIRECTIVE THE OBJECT CODE MAY BE PLACED
ANYWHERE IN MEMORY.
A LOC DIRECTIVE IS PROVIDED TO DEFINE AN OFFSET IN
MEMORY FOR THE OBJECT FILE ORIGIN.

NUMERIC CONSTANTS IN THE SOURCE MAY BE IN BINARY, OCTAL, DECIMAL, OR HE
THE OPERATORS +, *, /, - ARE ACCEPTABLE IN EXPRESSIONS.

THE FOLLOWING ASSEMBLER DIRECTIVES ARE IMPLEMENTED.

DB	DEFINE BYTE
DM	DEFINE MESSAGE
DS	DEFINE STORAGE
DW	DEFINE WORD
END	END OF PROGRAM
ORG	ORIGIN
.COMMENT	BLOCK COMMENT
.RADIX	SELECT NUMERIC BASE
.Z80	SELECT Z80 MNEMONICS
.8085	SELECT 8085 MNEMONICS
LOC	LOCATES CODE AT ADDRESS SPECIFIED

EDITOR - IFEDIT

THE EDITOR PROVIDES FOR IN-MEMORY EDITING OF AN ASCII FILE. THE FOLLOWING COMMANDS ARE AVAILABLE:

FEATURES OF IFEDIT
THE CODE IS IN ROM
THE TEXT FILE IS IN MEMORY (RAM)
11 BASIC COMMANDS
C CHANGE STRING1 TO STRING2
+ OR -ND DELETE N CHARACTERS
E PUT CURSOR AT END OF FILE
NF FIND N'TH OCCURANCE OF STRING1
I INSERT STRING1
+ OR -NK DELETE N LINES
+ OR -NL MOVE CURSOR N LINES
+ OR -NM MOVE CURSOR N CHARACTERS
T PUT CURSOR AT TOP OF FILE
U RETURN TO MONITOR
N<> REPEAT COMMAND STRING N TIMES
(MAY BE NESTED 2 DEEP)